POSTER SESSION

2029247896

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

P1 MEASUREMENTS OF ENVIRONMENTAL TOBACCO SMOKE IN AN AIR-CONDITIONED OFFICE BUILDING

C.J. Proctor, N.D. Warren & M.A.J. Bevan (BAT-UK&E) Research & Development Centre, Southampton, United Kingdom)

The objective of this study was to quantify the levels of various environmental tobacco smoke, ETS, constituents in offices in a modern air-conditioned building. Ten offices of varying size (from single occupancy spaces of around 40 m^3, to an open plan area of approximately 1500 m^3), total population (from one to thirty) and number of smokers, were each assessed on five separate occasions. Analytical measurements of nicotine, respirable suspended particulates (RSP), UV-RSP (the ETS contribution to total respirable particulates), carbon monoxide, carbon dioxide and a profile of volatile organic compounds were all taken on each visit. Although smoking was not restricted in this building, five offices were inhabited by non-smokers and five by at least one smoker.

The results show that the levels of ETS constituents were exceedingly low. Median values from the smokers offices yield levels of 4 $\mu g/m^3$ nicotine, 28 $\mu g/m^3$ UV-RSP and 1.1 ppm carbon monoxide. In non-smokers offices, carbon monoxide, for example, had a median value of 0.95 ppm. Moreover, a comparison of the volatile organic compounds present shows little difference between smoking and non-smoking environments.

P2 POLLUTION DE L'AIR PAR LA NICOTINE, A L'INTÉRIEUR DE DIVERS LOCAUX

C. Arfi, J. Kaloustian*, A.M. Pauli*, J. Pastor* , F. Grimaldi**, F. Gouezo**, A. Viala**, E. Muls**, F. Ravoire*, A. Crestin* & J. Prat* (*Laboratoire de Chimie Analytique & **Laboratoire de Toxicologie. Faculté de Pharmacie, Marseille, France)*

Le dosage de la nicotine dans l'air est réalisé sur un échantillon de 100 l d'air aspiré à un débit de 1 l/mn à travers deux cartouches en série contenant 100 mg de résine XAD – 2. Après désorption par l'acétate d'éthyle, l'analyse est effectuée par C.L.H.P. Un taux très élevé de nicotine de l'ordre de 200 $\mu g/m^3$ est trouvé dans un local fermé inoccupé où 20 cigarettes se consomment. Le lendemain, dans ce même local non aéré, le taux résiduel de nicotine est de 12 $\mu g/m^3$, ce qui pose le problème de la rémanence de la nicotine en absence d'aération et du tabagisme passif du non fumeur. Des dosages de nicotine sont effectués également dans ce même local mais dans des conditions d'occupation habituelles (présence de 2 ou 3 fumeurs, porte fréquemment ouverte), dans un bar au moment où la fréquentation est intense, enfin dans un amphi-théâtre de faculté où quelques étudiants fument entre les cours. Nous étudions évolution du taux de nicotine tout au long d'une semaine.

P3 HEALTH CONSEQUENCES OF ATOPY, FOOD INTOLERANCE AND INDOOR ENVIRONMENT: A CASE STUDY

E. Sammaljärvi (University of Helsinki, Dept. of Physics, Finland)

The results of statistical epidemiological studies suffer from many ambiguities, if not based on valid biological models. Indoor air/environment is a new field of environmental (health) science

2029247897

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

without any firm theory for the clear-cut exposure-response relationships. The aim of this postal questionnaire study, distributed in February, 1985, was to explore the relationships between various "allergy" expressions (skin-atopy and food intolerance), home environment and outdoor air pollutants in explaining upper respiratory way infections, irritation symptoms in eyes, and in central nervous system. All the explaining variables were dichotomized (0,1). Logistic regression and covariance analyses were employed. The study material consisted of 6900 adults living in two Finnish towns, the one was "clean" and the other with air pollution from pulp mills. Tiredness (CNS-symptoms) was best explained by food intolerance (risk rate, OR, was 2.1 for intolerants vs tolerants), visible dust at home (2.0) and bedroom air stuffiness (1.8). Eye symptoms were best explained by food intolerance (2.7), atopic skin symptoms (1.9), bedroom air stuffiness (1.8) and invading outdoor air pollutants sensed be the occupants. Chest tightness was best explained by food intolerance (2.5), atopy (2.1), bedroom air stuffiness (2.0). The cumulative incidence of sinusitis, middle ear infection and tonsillitis summed up was best explained by food intolerance (1.5) and bedroom air stuffiness (1.5). Food intolerance, atopic skin manifestations, visible dust and bedroom air stuffiness were statistically very significant explanators for symptoms. Daycare of children outside home was a significant explanator for tiredness (1.5) and sinusitis/ middle ear infection/ tonsillitis (1.3). Town as a separate variable explained tiredness (1.3) and eye symptoms (1.2). According to biological rationale hereditary exposition to allergies or intolerances combined with actual challenge increases risk to the appearance of allergy manifestations followed by e.g. an excess frequency of infections. The study results are in line with this rationale.

P4 ASSESSMENT OF EXPOSURE TO EMISSIONS FROM A LIQUIFIED PETROLEUM GAS STOVE USE IN URBAN INDIA

*V. Haraprasad & J.M. Dave (Neeri Zonal Laboratory, New Delhi & *School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India)*

Exposure of housewife to NO_x, CO and HCHO emissions from an LPG stove during a cooking cycle was assessed based on measure emission factors and appliance-use related emission inventory in a kitchen of 24 m volume. Direct flue-gas measurement technique was adopted in measuring the emission factors. Estimated indoor concentrations of NO, NO_2, HCHO and CO were 3.18, 4.85, 0.25 and 102.8 $mg.m^{-3}$ respectively, assuming the air exchange and decay rates of the pollutants emitted as negligible for the appliance-use duration of 83.5 minutes. Cultural and behavioural considerations apart, the variables which influenced exposures most were the kitchen volume and the air exchange rate. Results indicate that elevated concentrations of concern as indicated by the WHO could arise in indoor settings given the cramped living spaces in which these stoves (over ten million) are operated in urban India.

P5 QUALITY OF INDOOR ENVIRONMENT IN DWELLINGS ACCORDING TO PERFORMANCE OF HEATING SYSTEM

D. Petras (Slovak Technical University, Bratislava, Czechoslovakia)

The quality of indoor environment in dwellings is provided by physical properties of building constructions and by performance of HVAC systems. From the point of view of comfort, energy and economy as well, HVAC systems are designed and operated to maintain an acceptable indoor climate, i.e. an acceptable air quality and thermal environment, play the key role in dwellings. Especially the problem of thermal environment phenomena according to performance of heating system in dwellings is very important. The best way to solve this question is to apply the measuring and control technique in district heating systems, i.e. in the central source and/or exchanger-station, in building and in the each flat as well.

The aim of the paper is to show the differences of users thermal sensations and changes of operative temperature levels in vertical direction of dwellings according to performance of traditional convective 2 pipe heating system based on the experimental observation. The experimental measured heating circle, living area Bratislava-Raca, is supplied by heat from the central source. Heat distribution was at first exactly controlled according to changes of outdoor climate and secondary it was controlled individual by each of the users on their heaters by thermostatic valves. This control system keeps approximately the same level of energy consumption of specific flat in dwellings.

Generally we can see the certain differences of thermal sensations values of dwellings users during the heating season, i.e. sensations changes according to start, run and the end of heating period. The operative changes were approximately 3–4 K in vertical directions and they were caused by performance of heating system, i.e. by their hydraulic stability.

P6 ASSESSING THE VALIDITY OF A JAPANESE COHORT STUDY

*M.W. Layard & *J.R. Viren (Failure Analysis Associates, Palo Alto, California & *R.J. Reynolds Tobacco Company, Winston-Salem, North Carolina, U.S.A.)*

Results of a Japanese cohort study published by Takeshi Hirayama have been influential in the assessment of cancer risks of non-smoking women exposed to environmental tobacco smoke through their husbands' smoking. We analyzed the published data to assess their external and internal consistency. The principal method used was the construction of a hypothetical life table, which let us compare the reported mortality in the cohort with what would be expected from Japanese national death rates. We also performed an analysis of the age-specific lung cancer relative risks of spousal smoking among non-smoking married women. Our analyses revealed that reported cohort death rates were much lower than rates in the whole Japanese population. The most likely explanation appears to be that mortality tracing was incomplete, and that mortality rates among persons lost to follow-up were higher than those among persons successfully followed. We found that there was a highly significant downward trend with entry age in lung cancer relative risks among non-smoking married women. These anomalous results cast doubt on the validity of Hirayama's conclusions, and suggest the need for further analysis of the study data to seek explanations for the apparent inconsistencies.

P7 IMPACT OF BIOMASS COMBUSTION ON INDOOR ENVIRONMENT AND HEALTH

S. Jindal & R. Prasad (Centre for RD and AT, New Delhi, India)

A very little attention is being paid on Indoor Air quality in rural areas. The major source of air contamination in the villages is biomass combustion reportedly used by 50% of the world's population as a major or often the only source of domestic energy for cooking.

20292478898

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

The present paper evaluates the extent of exposure to various pollutants like Co, ASP, Benzo (a) pyrene, NO_x and SO_2 to human beings due to different biomass combustion and compares them with urban/modern fuels in laboratory and at actual field level. Studies conducted in simulated village kitchen show that people are exposed to a significant amount of CO and TSP ranging from 80–236 ppm and 2.4 mg/m^3 respectively in the case of cow dung. While the same is little lower up to 185 ppm in case of wood. Twigs ranks in between. A comparison of traditional fuels to modern fuels show lower concentrations of CO but higher NO_x and SO_2.

The field studies show lower pollution levels possibly due to higher air exchange rates. Data from two villages under study has been presented. Change in the design of combustion appliances of improvement in the existing ones reduces the exposure level of CO up to 4 to 7 ppm and 0.14 mg/m^3 of TSP. Increased ventilation inside the kitchen is another remedial measure. The impact of findings vis-a-vis health have been discussed.

P8 DESTRUCTION DES ACARIENS & BIODECONTAMINATION DE L'ENVIRONNEMENT DOMESTIQUE

M. Blanc & Ch. Boutin (Clinique de l'Oasis, Saint-Tropez & *Centre Hospitalier Universitaire, Marseille, France)*

LA POUSSIERE DE MAISON est un COMPOST généré par les ACARIENS. Constituée de moisissures, bactéries, pollens, plantes, insectes, squames, résidus fibreux, composants chimiques, goudrons de tabac, etc ...; elle est en perpétuelle dégradation biologique, les acariens y jouant un rôle déterminant, venant ajouter à cet ensemble leurs propres cuticules et déjections (allergène majeur). Cet environnement particulaire (1 à 5 u) est responsable avec la pollution et l'infection de l'hyper-réactivité bronchique et de la pathologie qui en découle.

Dans ces conditions l'EVICTION et la neutralisation de la poussière de maison et de ses composants sont essentielles dans le traitement et la prévention des broncho-pneumopathies liées à l'environnement domestique (Indoor Environnement).

A cet effet nous avons étudié l'action clinique du "PARAGERM AK"® (mélange d'huiles essentielles, acaricide et fungicide – J. CHARPIN & Coll. 1976) utilisé en aérosol d'atmosphère dans la totalité de l'habitat à l'aide du BRUMISATEUR MCR® (PARAGERM-HENKEL GV-06.510 CARROS France). Cet appareil d'utilisation hospitalière depuis plus de 40 ans permet une BIODECONTAMINATION qui a été proposée à 202 patients allergiques, observés pendant les années 85, 86 et 87 et présentant tous une pathologie reconnue par Prick-tests positifs à la poussière de maison et/ou acariens. 138 fois les poussières de la maison du malade ont été contrôlées par le dosage semi-quantitatif de la guanine (ACAREX-TEST. Labo. WERNER & MERTZ). L'aérosolisation (BRUMISATION) DE LA TOTALITE DE L'HABITAT a été pratiqué par 158 des 202 malades. Une évaluation rétrospective par questionnaire d'auto-évaluation adressée au terme de l'enquête (3 ans). Nous avons reçu 133 réponses: au terme du 6ème mois après la BRUMISATION 67% des malades vont très bien, 25% vont bien, soit un total d'amélioration de 92%. -ceux qui n'ont pas brumisé: 60% d'amélioration. Il est bien entendu que les traitements médicamenteux spécifiques et appropriés avaient été préconisés à tous.

Le protocole d'utilisation du BRUMISATEUR MCR DE PARAGERM AK est simple, son prix de revient est réduit. Les résultats cliniques sont favorables de façon significative. Actuellement nous avons mis en place dans les Départements du Sud de la France un réseau d'application de la méthode qui est préconisée par le Pneumologue, le patient louant l'appareil auprès des Pharmaciens ou distributeurs de matériel médical. Cette BRUMISATION DE PARAGERM AK est effectuée 2 fois par an: printemps et automne. Elle est parfaitement acceptée et suivie par l'ensemble des sujets à qui elle a été proposée.

2029247899

P9 OXIDES OF NITROGEN AND RESPIRATORY ILLNESS. IS THERE A SUSCEPTIBLE POPULATION?

J.M. Sneddon (The William Harvey Research Institute, St. Bartholomew's Hospital Medical College, London, United Kingdom)

During the past decade we have become increasingly aware of the importance of the indoor environment to our health and how this is influenced by the variety of air pollutants to which we may be exposed.

This report summarizes the generation and composition of the major sources of indoor air pollution with particular reference to the oxides of nitrogen which mainly derive from the combustion of domestic fuels (kerosine, gas) and from cigarette smoke. We review epidemiological studies on the relationship between respiratory symptoms or illness and domestic exposure to the oxides of nitrogen not only with respect to children but also others who may spend over 70% of their time indoors, such as the elderly. Results obtained from such studies raise many unanswered questions. For example, why do some members of a population develop respiratory illness and not others? What is the evidence that links respiratory distress to the dose of nitrogen oxides reaching the target tissues? We will also review the current literature for evidence that certain individuals may be at a particularly high risk due to acquired or inherited predispositions to the effects of oxides of nitrogen or other components of indoor air pollution.

P10 DUST IN THE WORK ENVIRONMENT: EFFECT OF PHARMACOLOGICAL AGENTS ON THE AIRWAY RESPONSE TO INHALED COTTON DUST

P.J. Nicholls, M. McDermot, M. Bevan & D. Griffiths-Johnson (Welsh School of Pharmacy, University of Wales, Cardiff, United Kingdom)

Exposure of mill operatives to cotton (CD) and certain other vegetable fibre dusts in their work environment may cause acute bronchoconstriction and in the long-term may lead to the development of byssinosis. We have examined the nature of the bronchoconstrictor response (decrease of airway conductance) in guinea pigs and human volunteers using aerosols of an aqueous extract of CD. In the guinea pig, bronchoconstriction was unaffected by antihistamines, cromoglycate and cyclo-oxygenase inhibitors but it was antagonised by a lipoxygenase inhibitor, a leukotriene (LT) receptor antagonist and a Ca^{2+} channel blocker. Generally similar results were obtained for man. The data support the view that the acute pulmonary effect of inhaled CD may be mediated by release of LTs in the airways.

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

P11 MODEL TO ASSESS THE CORRELATION OF INDOOR AND OUTDOOR AIR POLLUTANTS-EXPOSURE AND HEALTH EFFECTS

D. Ngoo Phong & all (Hanoi Medical School, Vietnam)

In studying the correlation between indoor and outdoor air pollutants of a building at Three Pagoda Square, our conclusions have been set up as follows:
– In the measurement, monitoring and modelling of indoor air pollution levels, we apply with success the simplest formula such as mass balance equation for a single well mixed compartment which takes the form:

$$Vdei/dt = P - E - Q(C_i - C_o)$$ of WHO 1982

– The constants and coefficients that characterise the modelled space have been established and proved to wait to the environmental conditions in Viet Nam.
– The prevalence of commonly encountered in Sick Building symptom was asserted in all hermetically closed rooms with varying systems for air conditioning and the results compared with symptoms detected among a population of workers exposed to all components of indoor air pollution in Viet Nam.

P12 STUDY ON THE INTERACTION OF RISK FACTORS OF ACUTE RESPIRATORY INFECTIONS IN CHILDREN BELOW 5 YEARS OF AGE IN VIETNAM

D. Ngoo Phong (Hanoi Medical School, Vietnam)

In the frame work of a study in a population of 200 households including 500 children below 5 years just in Tu-Hiep village, acute respiratory infection was detected as the result of an interaction between the host, the infection agent and the environment. Our conclusions have been carried out as follows:
– The child aged below 5 years may be impaired by previous illness and by poor nutrition
– The respiratory tract may be invaded by any microbial agents especially bacteria and fungi. Certain environmental circumstances favour the transmission of ARI agents. The interaction of the risk factors of ARI may be illustrated by mathematical model.
– An effective health education needs to be built in an effort to prevent deaths from ARI.
– The data are now being incorporated into primary care to minimize the environmental pollution sources (CO, CO_2, bacteria, fungi, ...) and to optimize the indoor environmental characteristics (air exchange rate, indoor activities in Viet Nam).

P13 STUDY ON HEALTH EFFECTS OF INDOOR AIR POLLUTANTS FROM DIRECT BURNING OF COAL WITH HIGH FLUORIDE CONTENT IN CHINA

Ji Rongdi & Cao Shouren (Institute of Environmental Health and Engineering Chinese Academy of Preventive Medicine, Beijing, China)

Indoor air pollutants due to burning of coal with high fluoride content inside house spread in 12 provinces from northeast to southwest of China. Local residents burn the coal containing high fluoride, sulfur and ash for cooking, heating and drying cereal (e.g. corn) in the room. The fluoride content of coal is 500-2000 mg/kg. A great amount of pollutants from coal burning inside house without chimney cause severe air pollution and food contamination of fluorides. The fluoride concentration in indoor air is 0.6 mg/M^3. The fluoride content in dust is 2000 mg/kg. The concentration of sulfur dioxide and inhalable particles are 1.0–22.0 mg/M^3 and 0.25–1.85 mg/M^3 respectively. The fluoride content in contamination cereals (e.g. corn) is 56.4 mg/kg or more. The total intake quality is estimated 2–18 mg/day/person. But the concentration of fluoride in drinking water is lower than national health standard (<1.0 mg/l). Prevalence rates of dental and skeletal fluorosis in the severe disease area are 90% and 40% respectively. Indoor air pollutants due to burning of coal with high fluoride content inside influence 50 millions of population. The severe status of disease, the wide distribution of prevalence are rare seen in the world.

P14 EXPOSURE TO CARBON OXIDE INSIDE SHOPS PLACED ALONG AN HIGH-TRAFFIC STREET

F. Valerio & C. Brescianini (Istituto Nazionale Ricerca sul Cancro, Genova, Italy)

The city center of Genova, is characterized by canyon-streets with a high traffic density. In one of the main streets (XX September Street), during the rush hours, about 3800 cars per hour may be counted. As a consequence atmospheric pollution is particularly high and the mean daily concentration of pollutants registered during a typical day are the following:
Airborne particulate: 114 µg/m^3; SO_2: 74 µg/m^3; NO_2: 116 µg/m^3; CO: 6.5 mg/m^3; O_3: 22.6 µg/m^3; Hydrocarbons: 1120 µg/m^3.

Obviously, diffusion of these pollutants into the shops placed alongside this street occur and exposure of shopkeepers to concentrations of concern may occur.

We have focused our attention on exposure to Carbon Oxide, as a typical pollutant produced by traffic.

Using a portable CO detector, inside and outside concentrations of this compound were measured, during different traffic conditions. First results showed that traffic density and distance from the main street are the more important factors that influence CO concentrations.

P15 STUDIES OF AIR POLLUTION AROUND A CEMENT FACTORY IN DAR-ES-SALAAM (TANZANIA)

M.W. Kudoja (Zoology Department, University of Nairobi, Kenya)

The cement factory in Dar-es-salaam was built in the late fifties and is located about 20 km from the city centre At the time of construction the factory was very much outside the city boundaries and was therefore not considered to be a health hazard.

With the years the city has expanded and the factory is now about ten km within the city

20292479OO

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

boundaries. Its proximity now prompted the idea of studying the effect of the factory on the surrounding air.

The objectives of the study was to monitor the air around the factory and assess if there is any effect on the inhabitants living around the factory. Plastic mosquito gauzes (2 × 2 mesh size) were mounted on a wooden frame 1 m × 1 m and mounted on another frame 2 m from the ground. The frames were located around the factory at approximately 1/2 km radius up to 2 km away. The gauzes were used to capture dust. After a period of about a week the dust was washed down using redistilled water and analysed for calcium using X-RF and carbonate using hydrochloric acid.

Data at a dispensary in the area was taken on bronchitis and chest problems. The results obtained show that the dust had elevated levels calcium carbonate which points the factory as the source of the dust. The dust having been very fine was also found in the houses and on the roofs. The data from the dispensary showed that there were many cases of chest complaints mainly among the old people. It was concluded that the factory is the source of the pollution and that the pollutant had a cumulative effect on human beings. It is suggested that the factory should install a water scrubber to reduce the dust and build taller chimneys to ensure that the dust is blown far away.

P16 EFFECT OF RESERVOIR FUEL LEVELS ON EMISSIONS FROM A KEROSENE COOK STOVE

J.M. Dave & V. Haraprasad (School of Environmental Sciences, Jawaharlal Nehru University, New Delhi & Neeri Zonal Laboratory, New Delhi, India)

A kerosene wickstove commonly used in the kitchens of urban India was studied to examine if change in reservoir fuel levels had any effect on the emissions. Measurements of NO, NO_2, HCHO, CO and particulate matter emissions were made at three reservoir fuel levels of 6 cm, 3 cm and 1 cm from the tank bottom using direct flue-gas measurement technique. Results indicated reduction in NO from 0.52 to 0.22, and in NO_2 from 3.56 to 2.10 and increase in HCHO from 2.25 to 3.56, CO from 103.94 to 162.71 and in particulate matter from 1.01 to 1.61 (all in $\mu g.KJ^{-1}$) at lower fuel levels in the tank. Potential effect of these emissions on indoor air quality are discussed.

P17 ETUDE DES RELATIONS A ECHELLE FINE ENTRE POLLUTIONS INTÉRIEURE ET EXTÉRIEURE (SO_2–NO_x–PARTICULES) DANS UN HOPITAL DE LA RÉGION PARISIENNE

J.C. Loewenstein (Electricité de France, Direction des Etudes et Recherches, Chatou, France)

Une importante étude épidémiologique longitudinale sur les relations entre l'environnement et la santé des vieillards a été menée pendant une période de 30 mois dans un grand hôpital de long séjour de la Région Parisienne (bâtiments de construction classique et non climatisés).

Au cours de cette étude, des mesures physiques d'environnement (NO_x, SO_2, particules, température, humidité, pression atmosphérique) ont été effectuées en continu à l'intérieur et à l'extérieur des locaux de l'hôpital: nous les avons exploitées ici à échelle de temps horaire. Les principaux résultats sont les suivants:

– On note une importante variation diurne des paramètres de pollution intérieure, avec un maximum en fin de matinée (NO_x) ou en début d'après-midi (particules). Les niveaux intérieurs de ces 2 polluants sont plus élevés qu'à l'extérieur.

– Les niveaux intérieurs de particules et de NO_x dépendent étroitement des niveaux extérieurs, mais ils varient aussi en fonction de la température extérieure (en sens contraire): ceci s'explique par le fait que la pollution extérieure est d'autant plus élevée que la température est faible. Par contre, ils dépendent assez peu de l'humidité relative extérieure.

– Un examen de la variation des écarts (et des rapports) entre polluants intérieurs et extérieurs montre que ce paramètre subit d'importantes variations diurnes: ceci correspond à un important surcroît ponctuel de pollution dû à l'activité intérieure quotidienne et à la présence de fumeurs.

– Le dioxyde de souffre présente moins d'intérêt dans cette étude en raison de la faiblesse de son niveau extérieur pendant les 30 mois de l'expérimentation. D'autre part, on vérifie que sa pénétration à l'intérieur des locaux est très réduite (corrélation quasi nulle), ce qui s'explique par l'importante réactivité physicochimique de ce polluant.

P18 MOULDS, MITES AND MOISTURE OF INNER WALLS IN DWELLINGS

H.S.M. Kort & J.E.M.H. van Boswijck (Interuniversity working group Home and Health, Department of Dermatology, Utrecht State University, Utrecht, The Netherlands)

Visible mould development in dwellings is convenient for the inhabitants, because of an unsighty view and the resulting air-borne allergens. Just as moulds, storage and fungal mites may cause health damage by allergen contamination of the indoor air. Moulds and mites on inner walls in Dutch dwellings were studied in relation to moisture levels. Moulds were sampled from damaged sites by both a tape and a scraping method. Mites, however, could only be collected with the tape method. They belonged to the superfamilies Acaroidea (storage mites) and Tarsonemoidea (fungal mites). Commonly identified fungal genera included: *Cladosporium, Aspergillus, Phoma, Alternaria*, and *Wallemia*. It appears that fungal problems in dwellings are dependent on the moisture situation and are connected with the occurrence of storage and fungal mites. *A. penicilloides* and *C. herbarum* were isolated from the same wall at the same height; however, at a different location and depth. This suggests different wall moisture conditions at the two damaged sites. Tarsonemoid mites and *A. penicilloides* shared the same niche. In one bathroom, *Phoma* occurred together with *Cladosporium*; and in another home both storage and fungal mites were present on a living-room wall.

Moulds and mites may be used as a biological sensor for physical factors that determine the dwelling climate. Temperature gradient, and moisture conditions may be deducted from the species found. The occurrence of storage and fungal mites, in addition to moulds on damp mineral inner walls of dwellings, presents a new concept for the house ecosystem and the health-damaging allergens derived from it.

20292479O1

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

P19 ABSOLUTE INDOOR AIR HUMIDITY AND THE ABUNDANCE OF ALLERGEN PRODUCING HOUSE DUST MITES AND FUNGI IN THE NETHERLANDS

G. Schober (Interuniversity working group Home and Health, Utrecht State University, Utrecht, The Netherlands)

Humidity in the ecological micro habitats of allergen producing house dust mites (Pyroglyphidae) and xerophilic house dust fungi, constitutes a key factor for population development and the resulting allergen content of dust in dwellings. Exposure of atopic patients to house dust mite and fungal allergens, is so extensive (both locally and on a geographical scale) that allergy towards these organisms is considered a world wide problem. Qualitative and quantitative analyses were performed on house dust samples, collected from 11 living-room floors in the Netherlands. Dust sampling took place around the start of the heating season. Numbers of mites and fungi were compared to absolute indoor humidity values. Dramatic population development of pyroglyphid mites (such as *Dermatophagoides pteronyssinus, D. farinae* group or *Euroglyphus maynei*) and xerophilic fungi of the house dust ecosystem took place at absolute air humidity values of 9 g/m^3 and higher. A significant correlation existed between the abundance of mites and fungi and indoor climate class. Our results should be compared to the previously suggested hygienic level of 7 g/m^3 absolute indoor air humidity for mite development in Denmark. We would like to extend the concept by introducing 9 g/m^3 as a preliminary hygienic value for house dust mites as well as house dust fungi in homes in the Netherlands.

P20 NICOTINE ABSORPTION IN HUMANS FOLLOWING EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE GENERATED FROM DIFFERENT TYPES OF CIGARETTES

J.D. deBethizy, L.E. Bates, R.A. Davis, D.L. Heavner, P.R. Nelson, J.C. Walker & J.H. Robinson (R.J. Reynolds Tobacco Company, Winston-Salem, North Carolina, U.S.A.)

The relationship between nicotine concentrations in environmental tobacco smoke (ETS; aged and diluted exhaled mainstream plus sidestream) and the concentrations of nicotine and cotinine in urine and saliva were evaluated in 15 non-smoking male subjects exposed to ETS from different types of cigarettes. In the first study, four subjects were exposed to ETS generated by 2 volunteers who smoked a total of 16 Kentucky reference cigarettes (K1R4F) over a two hour period. Each subject participated in two test sessions that were held in an environmental chamber in which the air exchange rate (6/hr) was controlled and temperature and humidity were monitored. Salivary nicotine racked the concentrations of nicotine in the ETS chamber which was continuously monitored in real time using mass spectrometry. This study indicated that salivary nicotine as well as urinary nicotine and cotinine could be used to quantify differences in the amount of exposure to nicotine in ETS. Using the conditions established in the first study, 11 adult male nonsmokers were exposed to clean air or ETS from 3 different cigarettes: K1R4F, an ultra low tar cigarette (ULT), and a cigarette that heats tobacco but does not burn tobacco (TEST) in four different test sessions separated by a week. Total urinary and peak salivary nicotine were 7-fold lower and urinary cotinine was 3-fold lower in the subjects when they were exposed to ETS from the TEST cigarettes than when they were exposed to ETS from K1R4F and ULT. These differences were correlated with a 7-fold lower concentration of nicotine in the chamber

2029247902

and with a reduced amount of nicotine inhaled from the ETS produced from the cigarette that heats tobacco. These results show that the concentration of nicotine in ETS from the TEST cigarette is substantially lower than in ETS from the K1R4F and ULT cigarettes resulting in lower concentrations of nicotine and cotinine in biological fluids.

P21 CHARACTERIZATION OF THE ENVIRONMENTAL TOBACCO SMOKE GENERATED BY DIFFERENT CIGARETTES

P.R. Nelson, D.L. Heavner & B.B. Collie (R.J. Reynolds Tobacco Company, Bowman Gray Technical Center, Winston-Salem, North Carolina, U.S.A.)

The concentrations of selected ETS (environmental tobacco smoke: sidestream + exhaled mainstream) constituents were measured and compared for smoke generated by: a) Kentucky reference (K1R4F) cigarettes, b) ultra low tar cigarettes (ULT), c) cigarettes that heat but do not burn tobacco (NEW cigarettes), and d) clean air. The cigarettes were smoked in an 18 m^3 stainless steel test chamber in which temperature (22 °C), relative humidity (50%), and air exchange rate (6 air changes/hour) could be controlled and/or monitored. A total of sixteen cigarettes were smoked by human volunteers during each of 24 two-hour test sessions. Real time concentration measurements were obtained for carbon monoxide, nitrogen oxides, total hydrocarbons, particle mass and number density, and nicotine during each session. Time weighted average concentrations of selected carbonyls, nicotine, and gravimetric total suspended particles were also measured. Small, significant ($P < .1$) differences between concentrations of carbon monoxide, FID response, particle mass concentration, and some aldehydes in the ETS of K1R4F and ULT cigarettes were measured. The NEW cigarette showed significant ($P < .01$), substantial reductions in the concentration of each compound measured in this study compared to the K1R4F and ULT cigarettes. Typical reductions in analyte concentrations in ETS generated by NEW cigarettes ranged from a 35% decrease in carbon monoxide concentration, to over 90% decreases in the concentrations of nitrogen oxides, particle mass, acrolein, acetaldehyde, and FID response. Overall the concentrations of ETS constituents produced by each cigarette followed the order K1R4F > ULT >> NEW.

P22 TIME-DEPENDENT VARIATIONS IN RESIDENTIAL FORMALDEHYDE LEVELS UNDER CONTROLLED CONDITIONS OF TEMPERATURE AND RELATIVE HUMIDITY

T. Godish & C. Guindon (Ball State University, Muncie, Indiana, U.S.A.)

This study was based on a retrospective analysis of daily measurements of formaldehyde levels in a urea-formaldehyde foam-insulated (UFFI) house and in a mobile home which had been controlled to internal environmental conditions of temperature (23.5° ± 1°C) and relative humidity (50 ± 50%). Major causes of formaldehyde level variations in both houses were identified to be associated with season and the decay of formaldehyde levels with time. Seasonal variations were strongly associated with indoor/outdoor temperature differences. Model regression equations were developed to standardize formaldehyde concentrations based on indoor/outdoor temperature differences (ΔT). These equations were of the form $C_X = C_o + 0.0015\ \Delta T$ for

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

the mobile and $C_x = C_o + 0.0018\ \Delta T$ for the UFFI house. Formaldehyde level decay in both the UFFI house and mobile home were modeled by polynomial equations which were quadratic in form.

P23 HEALTH AND SOCIAL PROBLEMS OF CARBON MONOXIDE POISONING BY USING ANTHRACITE COAL AS A SPACE HEATING FUEL IN KOREA

Yong Chung & Dongchun Shin (Institute for Environmental Research, Seoul, Korea)

Since the wide usage of the anthracite coal briquette as a main domestic fuel for space heating and cooking since the 1950s, a tremendous number of carbon monoxide poisonings have been reported, especially during the winter season. A number of researches concerning not only epidemiological or toxicological aspects of carbon monoxide poisoning but also technological and sociological aspects have been carried out in Korea in the past two decades.

These researches were reviewed and analyzed in this study and several factors were found in the result. In a 1974 survey in Seoul, the incidence of carbon monoxide poisonings were estimated at 306 per 10,000 population (260 were mild cases, 45 were severe (comatous) and one case expired). These facts told us that more than 1 million poisonings occurred every year in Korea. In a 1983 to 1984 survey, the overall incidence rate were 407 per 10,000 population, and there were 352 with mild poisoning and 54 with severe poisoning. With the assumption that the incidence rate was underestimated in the 1974 survey, carbon monoxide poisoning is a persistent indoor air pollution problem in Korea.

The house structure and method of heating, which usually is disadvantageous in tile low socioeconomic class, may be considered as one of the major causative factors besides the climate condition. Conclusively, carbon monoxide poisoning is not reduced in spite of the socioeconomic development in Korea and therefore further research and control measures in addition to treatment and emergency medical care system for carbon monoxide poisoning will be essentially required.

P24 CONTROLE DE LA QUALITÉ DE L'AIR DANS LES GARAGES COLLECTIFS

F. Cupelin & J.-Cl. Landry (Service cantonal d'écotoxicologie, Genève, Suisse)

Le service cantonal d'écotoxicologie du canton de Genève a entre autre pour mission de contrôler la qualité de l'air dans les garages collectifs publics.

La législation sur les constructions stipule que la concentration en monoxyde de carbone ne doit jamais dépasser 100 ppm. Dans le but de remplir notre mission, nous avons développé une méthodologie pragmatique qui permet de s'assurer que la loi est respectée et que l'exposition du public au monoxyde de carbone n'est pas excessive. Les échantillons d'air prélevés dans les garages sont stockés dans des sacs en saran, puis analysés au laboratoire. Pour chaque garage un parcours représentatif de l'exposition la plus forte est défini (éloignement de la sortie, zone la

20292479O3

plus occupée, etc...). Le temps moyen d'échantillonnage est de 3 minutes. Les mesures sont effectuées sur une période d'une année aux heures de plus forte exploitation.

Les garages sont déclarés conformes si la moyenne des mesures est inférieure à 100 ppm. On tolère un dépassement de cette limite pendant 5% du temps pour autant qu'il y ait un dispositif d'alarme.

De 1985 à 1988 une vingtaine de garages représentant près de 15.000 places a été contrôlée. On a pu mettre en évidence des disfonctionnements liés à la conception de la ventilation et au système de détection du monoxyde de carbone.

P25 UN ANALYSEUR D'OXYDES D'AZOTE A L'ETUDE DE LA POLLUTION INTÉRIEURE: L'APPI-AC 35

B. Millancourt (Electricité de France, Direction des Etudes et Recherches, Chatou, France)

L'analyseur par chimiluminescence AC 35 a été développé conjointement par EDF et la Société ENVIRONNEMENT SA pour répondre aux besoins liés à l'étude ou au contrôle de la pollution a l'intérieur des locaux: dimensions réduites – autonomie – portabilité en particulier.

Les résultats des tests d'évaluation de l'analyseur sont présentés; ils traduisent les efforts d'optimisation des différents organes ayant abouti à la réalisation d'un appareil ergonomique de manipulation simple destiné à un usage mixte (itinérant ou à poste fixe) possédant de bonnes caractéristiques métrologiques dans l'analyse alternative en continu du monoxyde d'azote NO ou des oxydes totaux NO_x.

Deux gammes de mesure sont disponibles: 0–2 ou 0–20 ppmV avec un seuil de mesure de 0,01 ppmV.

L'utilisateur a le choix entre une correction de zéro manuelle ou séquentielle automatique.

Un convertisseur chimique transforme quantitativement le dioxyde d'azote en monoxyde et permet d'accéder à la détermination des NO_x.

P26 AUTOMATIC ANALYSER PROTOTYPE FOR ATMOSPHERIC ISOPRENE AND MONOTERPENES

M.L. Riba, B. Clement, M. Haziza & L. Torres (Ecole Nationale Supérieure de Chimie de Toulouse, Institut National Polytechnique, Toulouse, France)

In environmental matter, essential problems arise concerning, first, the perturbation, due to human activities, of the biosphere-atmosphere equilibrium, and then the eventual change in trace compounds of atmospheric air (CO, hydrocarbons, NO_x, O_3, aerosols ...).

Among the numerous volatile organic compounds present in the atmosphere, isoprene and monoterpenes were the most studied because of their predominance in plant emissions and their important chemical reactivity.

In order to bring a contribution to the comprehension of the part played by those biogenic hydrocarbons in atmospheric physico-chemistry and in the biosphere-atmosphere exchange processes, we devised a totally automatic apparatus for sampling, preconcentration and analysis of isoprene and monoterpenes in the atmosphere.

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

This device is mainly composed of a gas chromatograph for analysis and a programmable controller to manage the operations. The whole apparatus shows an excellent fiability (repeatability of the measures lower than 1%) for sampling analysis complete cycles, automatically and continuously, over several days. Let's also notice that the analytical characteristics of the system are quite acceptable.

The apparatus miniature model will be used during 1989/90 for international campaigns, that must take place in CONGO, CANADA and GERMANY, to measure atmospheric terpenes concentrations and fluxes.

P27 PERMÉABILITÉ, ÉTANCHÉITÉ OU TRANSPARENCE A L'AIR DES BATIMENTS, DES APPLICATIONS DIFFÉRENTES POUR UN MEME PROBLEME

M. Kilberger (Centre d'Etudes Techniques de l'Equipement de Lyon, France)

Le renforcement de l'isolation thermique des constructions augmente la part du renouvellement d'air dans l'ensemble des déperditions. S'il existe une volonté d'ajuster la ventilation volontaire aux besoins d'hygiène de confort et de sécurité, il est nécessaire de réduire la composante parasite du renouvellement d'air liée à la perméabilité des constructions pour au moins six raisons:

- l'aspect énergétique,
- le confort thermique,
- le confort acoustique,
- la conservation du bâti,
- le bon fonctionnement de certaines techniques de ventilation,
- la qualité de l'air.

Les moyens d'évaluation de la perméabilité à l'air sur site existent et fournissent de riches enseignements.

L'exploitation des résultats de mesure met en évidence:

- les sensibilités différentes entre procédés constructifs et entre types d'habitats,
- les incidences de la mise en oeuvre,
- les localisations des infiltrations d'air.

L'acquis est important, mais il faut poursuivre dans ce domaine car la maîtrise de la perméabilité à l'air représente une étape importante qu'il ne faut pas négliger si l'on souhaite produire des constructions de qualité.

P28 TOBACCO SMOKE AND INDOOR AIR POLLUTION

*P. Thirumalaikolundusubramanian & S. Shanmuganandan (*Madurai Medical College & Department of Geography, Madurai Kamaraj University, India)*

Available data on indoor air pollution due to tobacco smoke were analysed in relation to ventilation facilities and cigarette smoked. It was observed that cigarette smoke consists of several thousand substances either in gas phase or particulate phase. Often carbon monoxide and

2029247904

sulphur dioxide concentration may exceed the permissible levels in work places. Nonsmokers absorb and metabolise various smoke constituents and they are at an increased risk of smoking related diseases. Providing adequate ventilation to overcome cigarette smoke is expensive and involves reconstructions. Hence smoking must be prohibited in office, working areas, corridors, lobbies, restroom, medical care centres, libraries, hazardous areas and travel cabins. If required, separate smoking areas may be provided and identified with suitable sign boards. In view of the hazards to the nonsmokers, existing laws on smoking in nonsmoking areas must be strengthened and implemented.

P29 ON THE USE OF ENVIRONMENTAL TOBACCO SMOKE COMPONENT RATIOS

G.B. Oldaker III, **W.E. Crouse & R.M. DePinto (*R.J. Reynolds Tobacco Company, Winston Salem, NC & **Lorillard Inc., Greensboro, NC, USA)*

Ratios involving concentrations of environmental tobacco smoke (ETS) components have been used to evaluate results from surveys of ETS exposure and to predict concentrations of unmeasured ETS components. To assess the validity of these uses, statistical analyses were performed on nicotine, respirable suspended particles (RSP), and ultraviolet particulate matter (UV-PM) concentration data obtained from surveys conducted in three environmental categories restaurants, offices, and passenger cabins of commercial aircraft. Ratios in terms of RSP/nicotine and UV-PM/nicotine do not differ significantly between categories; these ratios are not distributed normally, thus reflecting the underlying structure of the data. Correlation coefficients (R) associated with the ratios are comparable for offices and restaurants RSP/nicotine, 0.1975 and UV-PM/nicotine, 0.4526, RSP/nicotine, 0.1915 and UV-PM/ nicotine, 0.4026, respectively. By contrast, correlation coefficients for ratios associated with the aircraft cabin environment are substantially greater (RSP/nicotine, 0.7811 and UV-PM/nicotine, 0.9290), an outcome that is consistent with the absence of significant concentrations of outside particulate matter. These results show that use of ETS component ratios for evaluation or prediction of data is appropriate only in connection with the aircraft cabin environmental category.

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

INDEX OF AUTHORS

Figures refer to Abstract Numbers

Adlkofer, F.X., O27
Aiba, M., O29
Arciti, C., O21
Arfi, C., P2
Arundel, A., O41
Aström, T., O40

Balter, N.J., O2
Bates, L.E., P20
Bert, M., O34
Bevan, M., P10
Bevan, M.A.J., P1
Bierman-Lhytle, P., O55
Bignon, J., O50
Billick, I., O37
Bischoff, E., O53
Black, A., O26
Blanc, M., P8
Boutin, Ch., P8
Brescianini, C., P14
Brochard, P., O50
Burkart, W., O10

Cao Shouren, P13
Claude, J.R., O17
Clement, B., P26
Clement, E., O59
Collett, C.W., O18, O41, O58, O63
Collie, B.B., P21
Courtois, Y., O17
Crameri, R., O10
Crestin, A., P2
Crouse, W.E., P29
Cupelin, F., P24

Danuser, B., O16
Dave, J.M., P4, P16
Davis, R.A., P20
deBethizy, J.D., P20
Delruelle, N., O4
DePinto, R.M., P29
Doglio, B., O21
Doi, Y., O29
Dongchun Shin, P23
Dufour, G., O50

Efthymiou, M.L., O5

Festy, B., O17, O43
Furrer, D., O10

Garnier, R., O5
Gaudichet, A., O50
Gebefügi, I., O33
Gibbons, R.D., O32
Godish, T., P22
Coto, H., O36
Couezo, F., P2
Govaerts, M., O6
Griffiths-Johnson, D., P10
Grimaldi, F., P2
Guindon, C., P22

Haraprasad, V., P4, P16
Hartmann, L., O16
Haussmann, N.J., O15
Haziza, M., P26
Heavner, D.L., P20, P21
Hendel-Kramer, A., O34, O44
Hirayama, T., O13
Hirsch, A., O11

Imai, S., O48
Iwase, A., O29

Jacquignon, P.C., O62
Jantunen, M.J., O49
Jarczyk, L., O27
Jennings, R.A., O30
Ji Rongdi, P13
Jindal, S., P7

Kalliokosi, P., O49
Kaloustian, J., P2
Karmaus, W., O34, O44
Kaustia, K., O47

2029247905

Khudoley, V.V., O23
Kilberger, M., P27
Kilpatrick Jr., S.J., O14
Kira, S., O29
Kiviranta, A., O47
Knöppel, H., O28
Koo, L.C., O12
Kort, H.S.M., P18
Korte, F., O33
Kudoja, M.W., P1S
Kuhr, J., O34, O44

Landry, J.-Cl., P24
Laurent, A.M., O17
Layard, M.W., P6
Lebret, E., O60
Lee, P., O19
Loewenstein, J.C., O7, P17
Löfroth, G., O24

Mak, R., O8
Mansour, M., O45
Mantel, N., O25
Marie, J.P., O62
McAughey, J.J., O26
McDermot, M., P10
Millancourt, B., P25
Miyara, T., O29
Molina, C., O3
Morgan, W.T., O30
Moschandreas, D.J., O32
Mouilleseaux, A., O43
Muls, E., P2
Nelson, P.R., P20, P21
Nero Jr., A.V., O54
Nevalainen, A., O49
Ngoo Phong, D., P11, P12
Nicholls, P.J., P10

Oldaker III, G.B., P29

Pasanen, A.-L., O49
Pastor, J., P2
Pauli, A.M., P2
Petrás, D., P5
Pirsel, L., O46
Poffijn, A., O8, O9
Poole, A., O35
Prasad, R., P7
Prat, J., P2
Prelet, S., O17
Prignot, J., O8
Pritchard, J.N., O26
Proctor, C.J., P1

Ravoire, F., P2
Reynolds IV, J.H., O30
Riba, M.L., P26
Riboulet-Delmas, G., O5
Robertson, G., O39
Robinson, J.H., O30, P20
Ross, J.A., O18
Rylander, R., O15, O36

Saarela, K., O47
Saitoh, H., O29
Sammaljärvi, E., P3
Santi, L., O21
Scherer, G., O27
Schlitt, H., O28
Schober, G., O52, P19
Schultz, E., O34, O44
Schwartz, S.L., O2
Shanmuganandan, S., O31, O51, P28
Shimizu, Y., O48
Sneddon, J.M., P9
Sörensen, S., O36
Squinazi, F., O43
Staiger, H., O34, O44
Sterling, D.A., O32, O42
Sterling, E.M., O41, O58, O63
Sterling, T.D., O18, O58
Stock, T.N., O42

Tanaka, S., O36
Thirumalaikolundusubramanian, P., O31, O51, P28
Tinan, N., O6
Tissot, B., O6
Torres, L., P26
Trepte, L., O57
Trichipoulos, D., O20
Tsunetoshi, Y., O48
Urbanek, R., O34, O44

Valerio, F., P14
van Boswijck, J.E.M.H., P18
van Bronswijk, J.E.H.M., O52
van de Wiel, H.J., O60
van der Wal, J.F., O56
Vanhoorne, M., O8
Vanmarcke, H., O9

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000

Viala, A., P2
Viren, J.R., P6
Von Maltzan, Ch., O27
Von Meyerinck, L. , O27

Walker, J.C., O30, P20
Warren, N.D., P1
Weber, A., O16
Wei Chen, O38
Weinkam, J.J., O58
Weynants, P., O8
Wynder, E.L., O1, O22

Xingzhou He, O38

Yamauchi, N., O29
Yong Chung, P23
Yuasa, K., O36

2029247906

Source: https://www.industrydocuments.ucsf.edu/docs/mqdl0000